operators have conducted more PCS trials to date than any other segment of the telecommunications industry.

D. Summary of Status/Trends in Local Exchange Competition

CAPs are well-funded. They already have a presence in most of the major markets. They have already established business relations with most of the largest corporations. Their networks are operational and provide service over state-of-the-art fiber networks. Regulators (unwisely) handicap their primary competitors, the LECs. It is hard to describe a more promising growth scenario for an industry.

Cable companies today pass over 95 percent of U.S. television homes and serve over 60 percent of households.[26] The economics of their own industry is driving cable companies to install fiber optics, which can then be used to compete with LECs at low incremental cost. Furthermore, the cable industry, despite regulatory initiatives to limit monopoly rents, continues to generate huge amounts of cash. The industry has already begun to use some of that cash to invest in competing with local exchange carriers and will undoubtedly continue to do so throughout the 1990s. The Bell Atlantic-TCI merger and the joint arrangements between Southwestern Bell-Cox and U S West-Time Warner are likely to further this trend.

Cellular telephony has the advantage of portability. Its cost is high today because of limited availability of spectrum. In September 1993, however, the FCC took the historic step of increasing the spectrum available for wireless telephony fourfold. The increased spectrum is likely to increase the supply of wireless telephony and substantially drive down its price. When this happens wireless telephony will be able to compete head-to-head with LEC landline services.

Local services competitors are much better poised for rapid growth than were early[27] long-distance competitors. Transmission quality of the latter was degraded, since competitors

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[26]Figures provided by the NCTA.

[27]This discussion considers the competitive situation in long distance in the late 1970s after the *Execunet* decisions. *See* Re MCI Telecommunications Corp., 60 FCC 2d 25 (1976), reversed by the Court in 561 F2d 365 (D.C. Cir. 1977) *(Execunet I)* and Re American Teleph. & Teleg. Co. Petition for Declaratory Relief, 67 FCC 2d 1455 (1978), reversed 580 F2d 590 (D.C. Cir. 1978) *(Execunet II)*.

had to use additional analog facilities. Small customers had to dial many additional digits to make calls. WATS resale was not yet mandated; so competitors could not profitably offer universal termination of calls. Because of these handicaps, early long-distance competition developed a reputation for poor quality — a reputation that persisted many years.

Local-services competitors will apparently have none of these handicaps. Furthermore, customers are much more accustomed to using telecommunications competitors than they were in the 1970s. For these reasons, it is likely that local-services competition, especially competition for long-distance access, will grow far more rapidly than early long-distance competition.

These unprecedented changes are profoundly affecting the structure of the telecommunications industry. Within 10 years, many business and residential customers will have alternatives to the local telephone company. Fiber-based competitors (CAPs and cable companies) will offer broadband video and data services, in addition to voice communications. As prices of wireless services decline, their usage will become pervasive. The telephone network will evolve into a network of networks.

E. Implications for Regulation

Plans for regulatory reform are inherently long-term in nature. They should be designed to deal with developments that are likely to occur over the next 5 to 10 years. This section clearly demonstrates that rapid growth of competition is such a development. Plans for regulatory reform should anticipate the growth of competition. It should allow rapid and appropriate regulatory responses as competition in particular markets intensifies.

Indeed, appropriate long-run regulatory policies should be in place *before* competition becomes ubiquitous. Otherwise, the required changes may cause dislocations to competitors (who entered under the old policies) and their customers. Given the lengthy procedural delays always associated with regulatory change, the need to start the process of reforming regulation is urgent.

The trap to avoid is basing regulatory decisions on the extent of competition that exists today. Any policy established on that basis is likely to be unworkable within a few

years. Good public policies should be workable now and also be workable — without extensive fixes — when competition becomes much more intense.

III. EFFICIENCY INCENTIVES

ROR regulation has traditionally been used to regulate local exchange carriers. Such regulation reduces certain kinds of risks, but it significantly dulls incentives for efficiency. This section discusses both ROR regulation and some alternatives that can sharpen incentives and thereby improve productivity.

A. ROR Regulation

Traditional ROR regulation was practiced by the FCC before the AT&T divestiture, and continues to be practiced in several states. Under the traditional form of ROR regulation, carriers may petition the regulatory commission for rate increases if they believe that they cannot earn a "fair" return under existing rates.[28] The commission also may initiate a rate case if it believes that the company's earnings are excessive. In either case, a regulatory proceeding is initiated under which rates are supposed to be set to allow the company to earn a fair return. After rates are set in a regulatory proceeding, they remain in place until the next proceeding. Depending on numerous conditions, the next rate case may be the following year or several years later. In any event, traditional ROR regulation embodies a lag between the time that costs change and the time that rates change to reflect the change in costs. The regulatory lag is variable.

After the AT&T divestiture, the FCC established revised ROR procedures, under which interstate rate proceedings were conducted approximately once a year for both AT&T and the LECs. The Commission adopted policies that substantially reduced the per-minute costs of interstate services and cost reductions were passed on to consumers in regulatory rate

[28]Although there is no specific mathematical formula for determination of "fair and reasonable" return, two Supreme Court cases guide that determination. *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia* (262 U.S. 679, 1923) sets the reasonable rate standard as one permitting ". . . a return on the value of the property . . . equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties . . . ." *Federal Power Commission v. Hope Natural Gas Company* (320 U.S. 391, 1944) reemphasized the *Bluefield* statements, but recognized that revenues must also cover capital costs. Later Supreme Court cases have reiterated the criteria set forth in *Hope*.

proceedings.[29] Annual proceedings were called for in order to expedite the flow-through of savings to consumers. Under these procedures, the *effective* regulatory lag is approximately one year — considerably shorter than under traditional ROR regulation where the effective lag was more variable.[30]

With regulatory lag, cost changes are not immediately passed on to customers. Hence, the company retains some incentive to improve efficiency. (*We use the term "efficiency" broadly in this study to include reducing costs, offering profitable new services, and being appropriately responsive to customer needs.*) In particular, the company gets to keep the fruits of efficiency gains until the next rate proceeding.

Nevertheless, the incentives to improve efficiency are substantially diluted, compared to those in unregulated industries. For example, if an unregulated competitive firm makes long-lasting efficiency gains, it enjoys benefits (in the form of higher profits) as long as the gains persist.[31] On the other hand, a regulated firm enjoys higher profits only until the next rate proceeding. Productivity gains are thereby shared between the regulated company and its customers.

The dilution of incentives would make no difference if efficiency gains could be achieved effortlessly. Unfortunately, that is rarely the case. Efficiency gains generally involve changing established ways of doing business and the frustrating process of learning how to operate efficiently under the new conditions. Workers incur personal costs, as they may have to be retrained, relocated or laid off. Firms, whether regulated or not, are disinclined to take such actions unless the financial rewards are substantial.[32] With ROR regulation, the rewards are often not substantial enough to induce the efficiency gains.

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[29]The Commission established a federal Subscriber Line Charge (SLC) that recovered a portion of nontraffic-sensitive (NTS) costs on a per-line basis rather than on the basis of minutes of use. Also, substantial costs were shifted from the interstate jurisdiction to state jurisdictions.

[30]Many states undertake frequent periodic reviews, but reset rates less frequently.

[31]This issue is discussed further in the next subsection.

[32]This trade-off is explicitly modeled by R. Schmalensee, *op. cit.* and J. J. Laffont & J. Tirole, "Using Cost Observations to Regulate Firms," 94 *Journal of Political Economics* 614 (1986).

In this regard, ROR regulation resembles cost-plus procurement.[33] Under such procurement, the supplier bears *some* cost if there are sizable overruns; namely, customer dissatisfaction and reduced prospects for future sales. However, these penalties are much less severe than having to absorb the entire cost overrun. Consequently, suppliers under cost-plus contracts do not expend sufficient effort to reduce costs, and large cost overruns are commonplace.

B. Measurement of Efficiency Incentives

We can measure the efficiency incentives provided by alternative regulatory plans. We simply calculate the fraction of gains that the firm gets to keep if it improves efficiency.

In a purely competitive market, the market price does not depend significantly on the behavior of the firm (or of any other single firm). In particular, the price is independent of the firm's costs; it depends only on the costs of the firm's competitors.

Consequently, if the firm lowers its costs, the market price does not change. Furthermore, in a purely competitive market, the firm can sell its entire output at the market price. It therefore has no incentive to lower prices because its costs are reduced. The end result is that all cost savings flow directly to the firm's bottom line.[34]

It follows that unregulated competitive firms have maximal incentives to improve efficiency. Firms subject to cost-plus regulation, with no regulatory lag, get to retain zero percent of any efficiency gains; they have no incentive whatever to improve efficiency. Most actual regulatory plans fall somewhere in between these two extremes.

The mechanics of measuring incentives are discussed in the Appendix. Our proposed measure naturally depends on the specifics of the regulatory plan. It also depends on three

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[33] *See* William E. Kovacic, "Commitment in Regulation: Defense Contracting and Extensions to Price Caps," *Journal of Regulatory Economics*; 3:219-240 (1991), Kluwer Academic Publishers, Boston.

[34] Consumers benefit as all firms respond to those incentives to improve efficiency, and the market price declines. However, each firm still retains full efficiency incentives. If a firm makes greater efficiency gains than other firms, its profits increase; if it makes lesser efficiency gains than other firms, its profits decline.

Consumers benefit further if the efficiency gain involves product innovation. In that case, infra-marginal consumers enjoy additional consumer surplus.

Since taxes must be paid under all regulatory scenarios, we reasonably disregard them in this analysis.

parameters: the duration of efficiency gains, the discount rate and the growth rate. Assumed values for the parameters are stated and justified in the Appendix.

According to this measure, the incentives embodied in ROR regulation, as practiced by the FCC with a one-year lag, afford only about 14 percent of the efficiency incentives that exist in unregulated competitive markets. Thus, that mode of regulation differs only slightly from pure cost-plus regulation. It actually provides only a small fraction of the efficiency incentives supplied in unregulated competitive markets.[35]

C. Incentive Regulation

Most incentive-regulation plans are hybrids between direct price regulation and ROR regulation. The term of the plan is typically 3 to 5 years. The aggregate price level is limited by a price freeze or formula that is set in advance.[36] The allowable price level changes each year in accordance with the formula. However, the formula itself does not change during the term of the plan. There is often an additional sharing mechanism by which prices are adjusted downward if the firm's earnings are high and adjusted upward if earnings are low.[37]

In this section, we focus initially on pure price regulation, with no sharing mechanism. Sharing mechanisms are discussed at the end of the section.

1. Pure Price Regulation

Under price regulation. the pricing formula is generally designed to yield lower rates than expected under ROR regulation. The FCC denoted these expected savings as the

[35]Efficiency incentives are even lower if regulators do not fully take into account the fact that some efficiency gains are transitory. See Appendix for further discussion of this issue.

[36]This does *not* apply to services subject to streamlined regulation, as discussed below.

[37]Two notable exceptions are the AT&T and BT price-cap plans. Those plans contain no sharing mechanism.

"Consumer Dividend."[38] Regulators may also try to get more for customers by negotiating favorable terms at the end of the term of the price-regulation plan.

The Consumer Dividend does not in any way dull (marginal) efficiency incentives. The firm commits to adjust prices in accordance with a productivity commitment (including the Consumer Dividend) that is fixed in advance and does not depend on its *actual* efficiency gains. Thus, any incremental gains or losses in economic efficiency relative to the productivity commitment flow directly to the firm's bottom line. Since incentives remain fully intact, the Consumer Dividend does not reduce the efficiency gains that can be expected, once the company is operating under price caps.

However, if regulators elect to establish a Consumer Dividend and set it too high, the entire plan for regulatory reform may fall through. Price regulation is unlikely to work well in practice unless the regulated firm, as well as the regulator, agrees to the plan. Otherwise, the firm could rely on getting regulatory relief, as provided for by the *Hope* decision,[39] if its earnings fall below the cost of capital. Under these circumstances, the usual efficiency incentives of price regulation would be absent. In order to avoid this result, any Consumer Dividend must be set at a level which benefits the company, as well as customers. Since the efficiency gains from incentive regulation can be large, there will probably be a wide range of Consumer Dividends that benefit both the company and customers.

On the other hand, renegotiating the price-cap plan at the end of each term does dull incentives.[40] Suppose that the firm improves efficiency during the price-cap period. Many of the efficiency gains will be long-lasting and persist after the end of the price-cap period. If rates are lowered at the end of the price-cap term, the firm derives no profit from the continuing benefits of its efficiency gains.

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[38]The Consumer Dividend is over and above the productivity gains that would be expected under continued ROR regulation. The productivity offset in the FCC price-cap plan is the sum of the expected productivity gains under ROR regulation and the Consumer Dividend.

[39]*FPC v. Hope Natural Gas Co., op. cit.*

[40]This effect is noted in Paul R. Joskow and Richard Schmalensee, "Incentive Regulation for Electric Utilities," *Yale Journal on Regulation*, Vol. 4, No. 1, Fall 1986, p. 25.

The prospect of rate reductions when the price-cap plan is renegotiated reduces efficiency incentives from the start. The firm is less inclined to improve efficiency in the first place. Less efficiency gain can be expected, the more frequently the plan is renegotiated. The deployment of new technology and the pace of innovation are key sources of efficiency gains that are substantially retarded when the firm cannot expect the benefits to be sustained. If the regulated carrier is to be encouraged to make profound, systemic changes, then efficiency incentives must be sustained over a period of time long enough to be reflected in capital deployment decisions and fundamental marketing decisions that give rise to efficiencies.

Efficiency incentives are maximized with indefinite-term price caps, under which the pricing formula is specified in advance and never changes. Under price caps with an indefinite term, the firm may make a productivity commitment, including a Consumer Dividend. However, the firm loses none of the benefits of its *incremental* gains (relative to the productivity commitment) through regulatory repricing. It also bears the full brunt of any losses in productivity. The (marginal) efficiency incentives, therefore, are the same as in unregulated competitive markets. Because efficiency incentives are so great, the Consumer Dividend under indefinite-term price caps can be larger than under short-term price-cap plans.

Long-term price caps may be impractical in the absence of additional safeguards. The price-cap formula must be set, while the future is not known with certainty. Indeed, with the rapid advance of technology and growth of competition in the telecommunications industry, the future is *very* uncertain. Consequently, the price-cap formula may become inappropriate after an extended period of time. However, the evolution of vigorous competition will provide an important safeguard to correct for errors in the establishment of the price-cap mechanism. As in the case of AT&T's price-cap plan, competition can be expected to ultimately become the predominant form of discipline for prices, replacing price caps over time. Thus, the risk of a longer-term price-cap plan is reduced by the growth of competition.

Albeit that indefinite-term price caps may involve excessive risk, price-cap plans with terms longer than 3 to 5 years should be seriously considered. Table 1 shows the amount of efficiency incentives provided by pure price-regulation plans with terms from 1 year to 10

years.[41] With a term of one year, price caps are identical to the FCC's variant of ROR regulation. Under either regime, the firm gets to retain the benefits of its efficiency gains for only one year. Consequently, efficiency incentives are about 14 percent, the same as before. With longer terms, the efficiency incentives increase. They are about 35 percent for a 4-year term and about 71 percent for a 10-year term.

In choosing among these pure price-cap plans, the significantly greater efficiency incentives of long-term plans must be traded off against the greater risk. The academic literature provides some guidance in making this trade-off. Richard Schmalensee, in his paper "Good Regulatory Regimes," examined the trade-off between risk and efficiency incentives in price-cap plans. He concluded that for a range of plausible parameter values, efficiency incentives are (on average) optimized at approximately the 63 percent level.[42] Below 63 percent, incentives may be inadequate and yield too low a level of efficiency. Above 63 percent, the risk may be excessive; *i.e.*, the expected losses from misspecifying the productivity commitment (too high or too low) may outweigh the incremental efficiency gains from sharper incentives. Schmalensee's analysis suggests that regulators should not adjust the pricing formula until 8 to 10 years in the future.[43]

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[41]See Appendix for discussion of the methods used to measure incentives.

[42]Schmalensee's paper does not explicitly address the term of the price-cap plan, but it does focus on the trade-off between risk and efficiency incentives.

The cited result applies to the case in which the regulator maximizes consumer benefit subject to allowing the firm to have non-negative expected profits (over and above its cost of capital). Higher efficiency incentives (86 percent) would be optimal if the regulator sought to maximize overall economic welfare, including the firm's profits as well as consumer benefits.

[43]Prices would, however, be adjusted each year in accordance with the original formula. Other adjustments may also be appropriate on an ongoing basis. For example, we recommend annual reviews to streamline regulation of additional services and remove services from regulation, as competition evolves.

Table 1 Efficient Incentives Under Pure Price Caps (No Earnings Sharing)	
Term of Plan	Efficiency Incentives Relative to Unregulated Markets
(Years)	(Percent)
1	14
2	21
3	29
4	35
5	42
6	49
7	55
8	62
9	67
10	71

It appears from the Schmalensee analysis that regulators have been excessively cautious in reviewing the pricing formulae after 3 to 5 years. Reviewing the pricing formulae less frequently could greatly increase efficiency incentives and would allow the consumer dividend to be higher.

2. Sharing Mechanisms

Regulators have further dulled the efficiency incentives under price caps by having additional "sharing" mechanisms incorporated into their price-cap plans.[44] Under sharing mechanisms, the firm gets to keep only a fraction of efficiency gains — even during the initial price-cap period. The higher the sharing percentages, the less are the efficiency incentives and the less are the efficiency gains. Sharing is inherently counter-productive when the term of the price-cap plan is too short, and incentives are too diluted to start with — as is the case with all existing price-cap plans.[45] This applies, in particular, to the FCC's price-cap plan for LECs. The FCC plan is thus a hybrid between pure price caps and ROR regulation.

Table 2 shows the marginal efficiency incentives under price regulation with 50/50 sharing of earnings. The table applies only to firms whose earnings are in the sharing range. Under the FCC hybrid price-cap plan for LECs, 50/50 sharing occurs if the LEC's earnings are between 12.25 and 16.25 percent per year.[46]

As the table shows, a 4-year hybrid price regulation plan with 50/50 sharing has approximately 18 percent of the efficiency incentives provided in unregulated competitive markets. These incentives only slightly exceed those under 1-year ROR regulation.

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[44]For example, under the LEC price-cap plan, LECs choosing a 3.3 percent productivity offset must share with their customers 50 percent of earnings between 12.25 percent and 16.25 percent, and 100 percent of earnings above the 16.25 percent level. Under the California plan, earnings above a benchmark rate of return, set 150 basis points above the expected rate of return, are shared equally between shareholders and ratepayers. In Kentucky, there is 50/50 sharing on return on capital between 11.61 and 13.11 percent. Above 13.11 percent, South Central Bell retains 25 percent and returns 75 percent to ratepayers.

[45]More generally, sharing plans have all the same infirmities as ROR regulation (see footnote 1), but to a lesser degree.

[46]If LECs elect to lower prices further to a level reflecting a higher 4.3 percent productivity offset, they may retain 50 percent of the earnings between 13.25 and 17.25 percent.

Table 2 Efficient Incentives Under Hybrid Price Caps with a 50/50 Sharing Mechanism	
Term of Plan	Efficiency Incentives Relative to Unregulated Markets
(Years)	(Percent)
1	8
2	11
3	15
4	18
5	22
6	25
7	29
8	32
9	35
10	37

Without sharing, efficiency incentives would be at the 35 percent level (as shown in Table 1), far below the optimal level of 63 percent. The sharing mechanism goes in the wrong direction and reduces efficiency incentives. Sharing mechanisms have the additional drawback of making it more difficult to streamline regulation of selected services (see Section D).

3. Timing of Consumer Dividend

Under longer-term price-cap plans, the Consumer Dividend could be higher than under current plans. However, the incumbent regulatory commission may be unable to bind future commissions (or even itself) not to renegotiate the price-cap plan prior to the end of the term. Without a binding commitment, the firm most probably would be strongly opposed to a

commitment to a large Consumer Dividend. This has not been a problem with short-term price-cap plans, because the Consumer Dividends have been moderate (commensurate with expected efficiency gains). This would be a more serious concern with long-term plans, having large Consumer Dividends.

A solution to this problem is to have the Consumer Dividend automatically increase in the latter part of a long-term plan.[47] The higher levels of the Consumer Dividend would then be paid only after future regulatory commissions demonstrate good faith by not renegotiating the plan.

For example, suppose that the term of the price-cap plan were 10 years. The Consumer Dividend for the first 5 years could be set at a level appropriate for a 5-year plan.[48] At the end of the 5 years, the plan would *not* be renegotiated. However, there could be an automatic increase in the Consumer Dividend. The increase would apply until the end of the 10-year term. The increase in the Consumer Dividend could amount to some fraction of the expected incremental efficiency gains from having a 10-year plan instead of a 5-year plan.

D. Streamlined Regulation of Selected Services

Another way to enhance efficiency incentives is to streamline regulation in selected markets. Streamlined regulation would resemble the regulation of AT&T in the interstate jurisdiction for Baskets 2 and 3.[49] It would also resemble interstate regulation of other long-

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[47]The offset (over and above the Consumer Dividend) to reflect *historical* productivity may be constant during the term of the plan. Alternatively, it may move up or down to reflect expected *exogenous* changes in productivity; *e.g.*, as a result of competition.

[48]The plan would also have an adjustment for inflation and for expected future productivity growth under ROR regulation. The adjustment for future productivity growth might differ from previous productivity growth in order to reflect expected further developments.

[49]In its 1991 Interexchange Competition proceeding, the Commission determined that sufficient competition existed in certain market segments to allow some regulatory relaxation for all "basket 3" business services except analog private line services. The business services basket (basket 3) includes ProAmerica, WATS, Megacom, SDN, other switched services, voice grade and below private line service, and other private line service. 6 F.C.C. Rcd at 5881 & n.4. The Second Report and Order in Docket 90-132, released May 14, 1993, extended to all AT&T 800 services, except 800 directory assistance, the "further streamlined regulation" that was granted to most of AT&T's other large business services under an earlier order in the same proceeding. Price-cap ceilings, bands and rate floors no longer will apply to these services, which previously constituted AT&T's "basket 2" services under price-cap regulation. 8 F.C.C. Rcd 3668.

distance carriers. Under streamlined regulation, tariffs generally require no cost support and are rapidly approved.[50] In markets under streamlined regulation, the firm's earnings are not subject to regulatory oversight, and the firm has no guarantee of a fair return. The selected markets are subject to 100 percent of the efficiency incentives of unregulated competitive markets (instead of 18 or 35 percent).[51]

In this discussion, we assume that prices in markets not subject to streamlined regulation (unstreamlined markets) are governed by price regulation. During the period of the price-regulation plan, the prices in unstreamlined markets are limited by specific constraints; *e.g.*, price caps. They are unaffected by whether other services have streamlined regulation. As a result, streamlining of regulation in selective markets is much easier under price regulation than under ROR regulation. The regulator must, of course, ensure that customers in streamlined markets are not subject to abuse of market power. However, he or she need not be concerned about the effect of streamlined markets on customers in *unstreamlined* markets. Price regulation, itself, affords the latter customers adequate protection. Indeed, that protection is an important benefit of price regulation (with no sharing mechanism).[52]

Also, during the period of the incentive-regulation plan, costs need not be allocated between streamlined and unstreamlined markets. So long as there is no sharing mechanism, prices during the period would be unaffected by cost allocations. Foregoing cost allocations can greatly expedite the process of streamlining regulation, as streamlining becomes appropriate in particular market.[53]

For these reasons, we focus below on potential abuse of market power (e.g., excessive rates and inadequate quality of service) in the markets to be streamlined. Under streamlining,

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[50]In the August 18, 1993 order (CC Docket 93-36), streamlining federal tariffing requirements for nondominant interexchange carriers' tariffs may be filed on one day's notice (see 8 FCC Rcd 6752).

[51]Efficiency incentives are no more than 35 percent under the current interstate price-cap plan, which has a four-year term. Incentives could be increased above 35 percent by adopting a longer-term plan.

[52] This benefit is lessened if the incentive-regulation plan provides for sharing of earnings during the period of the plan. That lessening is an additional drawback of sharing mechanisms — over and above the dilution of incentives discussed in the previous subsection.

[53]Regulators do, however, need to consider forward-looking costs when it comes time to renew the plan. They need to make sure that under the new plan, revenues in unstreamlined markets can cover the costs (including a fair return to capital) attributed to unstreamlined markets.

regulatory actions are no longer relied upon to prevent such abuse. The regulator must, therefore, ensure *in advance* that abuse of market power will not be a problem. That is the basis for selecting which markets are to be subject to streamlined regulation.

Firms in industrial markets almost invariably have some degree of market power.[54] The regulator must, therefore, develop a standard for "cognizable" market power. That is, regulation in a market can be streamlined if and only if the firm's market power in that market does not exceed the cognizable limit.[55]

Selecting an appropriate standard involves making a trade-off between the potential losses from abuse of market power under streamlined regulation versus the costs and infirmities of unstreamlined regulation. In particular, the regulator must determine whether the potential abuse of market power under streamlined regulation outweighs the 65 to 82 percent reduction of efficiency incentives (from 100 percent to 35 or 18 percent) under unstreamlined regulation.

Where customers have no reasonable alternatives to the company's service, unstreamlined regulation is likely to be warranted. The large reduction in efficiency incentives, while unfortunate, must be endured. On the other hand, if customers *do* have reasonable alternatives, the benefits of unstreamlined regulation are unlikely to justify the large loss of efficiency associated with such regulation — not to mention the large direct costs of unstreamlined regulation.

E. Standard for Noncognizable Market Power

We would suggest the following standard for streamlined regulation of a service:

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[54]Market power may, for example, derive from product differentiation or from the firm's location.

[55]We use the term "cognizable," since the above standard is analogous to "cognizable interest" under the Commission's broadcast/cable cross-ownership rules; e.g., FCC rules on broadcast ownership (ownership of broadcasting stations by other broadcasting stations or by newspapers) barring "cognizable" interests (47 C.F.R. §73.3555).

(a) Competitors offer comparable services at comparable (or lower) quality-adjusted prices;[56] and

(b) Competitors can "reach" customers who account for a certain sizable fraction of total demand; *e.g.*, a competitor's network passes the customer or a competitor can reach the customer via LEC facilities.[57]

Conditions (a) and (b) together define our proposed standard for noncognizable market power. The standard is *not* a market-share test and is far preferable to a market-share test. Our proposed test is whether customers have reasonable alternatives. A market-share test relates to how many consumers have actually adopted particular alternatives. Market-share tests have limited value as indices of market power.[58] In addition, using market-share tests for regulatory purposes perversely creates incentives for the incumbent firm to fail; *i.e.*, not to compete effectively. Declining market share often results from high cost of providing the service and/or poor quality of service. Favorable regulatory treatment based on reduced market share, therefore, rewards the firm for high cost and low quality; it punishes the firm for low cost and high quality.

We would further recommend that LECs be afforded substantial freedom to disaggregate services; *e.g.*, within a defined geographic area or jurisdiction in order to create a service that will pass the test for streamlined regulation. When regulation in a market is streamlined, the competitor naturally loses the protection of (industry-specific) regulation.[59] However, the competitor enjoys a large compensating benefit; namely, the LEC cannot cross-subsidize the streamlined service. In general, any price reductions to meet competition reduce the LEC's

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[56]Wireless service would, for example, satisfy this criterion if transmission quality were comparable to that of landline service and the price were only slightly higher. The slightly higher price would be balanced (quality-adjusted) by the advantage of portability.

[57]This condition is intended to apply to outside plant and spectrum licenses. It is *not* necessary for competitors to have substantial excess capacity in central office equipment or circuit equipment, which can be quickly added as justified by demand.

Conditions (a) and (b), together imply that legal barriers to entry have been removed. They also imply that where equal access is necessary to compete, it has been provided.

[58]*See*, for example, Franklin M. Fisher, *Industrial Organization, Economics, and the Law*, edited by John Monz, The MIT Press, Cambridge, MA, 1991, p. 15.

[59]The competitor, however, continues to enjoy the protection of the antitrust laws, including the right to bring private antitrust suits.

bottom line. This lost revenue cannot be made up by raising prices in unstreamlined markets.[60]

In general, the public interest is best served if regulators let competition freely operate in the market. The company should be allowed to disaggregate the part of a service that becomes competitive. By so doing, price-cap constraints eliminate any incentive to cross-subsidize and free the regulator from being forced to play the awkward role of referee in competitive markets. Absent streamlined regulation, the critical competition will take place in the regulatory hearing room — not in the market. That is unfortunate, since it is competition in the market that benefits consumers. Competition in the market yields lower prices, higher quality, and more rapid innovation. Competition in the hearing room yields ever more imaginative legal arguments. The regulatory process also facilitates cartelization of the industry, since price cutting must be disclosed and is subject to regulatory delay.

We propose that the standard for "sizable fraction" in Condition (b) be a fixed number. The number would be determined in a generic regulatory proceeding. The same number would apply to all services and markets being considered for streamlined regulation. Each individual service or market would then be tested separately to determine whether it meets the standard.

A generic standard for "sizable fraction" is appropriate, since streamlining should occur in many small markets. Determining a separate standard for each market or service would result in lengthy delays and large costs without providing commensurate customer benefits. The same result would occur if the standard was complex and/or unspecific; then a regulatory proceeding would be required for each case to determine the applicability of the standard. On the federal level, the administrative problems of developing separate standards for each service or market would be completely unmanageable. The goal should be to achieve rough justice, while strictly limiting administrative costs and delays.

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[60]Prices in unstreamlined markets will, of course, change over time, in accordance with regulatory policies. Allowable price changes do not, however, increase as a result of the firm's incurring losses in unstreamlined markets.

If our proposed standard were appropriately implemented, some markets, mainly in large metropolitan areas, would qualify for streamlined regulation today.[61] Regulation of much of the transport market would be streamlined shortly after collocation is implemented. As competition evolves, more and more markets would be subject to streamlined regulation. Within 5 years, regulation should be streamlined in many LEC markets. Within 10 years, a sizable portion of LEC revenues should be subject to streamlined regulation. Indeed, events of the past few months portend an acceleration of competition that may require markets to be streamlined even more rapidly.

From an economics perspective, the further step of deregulation in selected markets would be constructive.[62] If tariffs need not be filed, price cuts can be confidential. Each firm would then have greater opportunity to seize additional business before competitors became aware of the price cuts. The ultimate result would be more intense competition and lower prices to consumers.

F. Market Segments

Because of transactions costs and/or installation costs, competitors may be able initially to compete most effectively for only certain customers (based on characteristics such as size and/or location).[63] Consequently, some customers may have more and better competitive alternatives than others. For this reason, appropriate standards for streamlined regulation in some markets may differ for differently situated customers. More generally, competition may progress at varying paces in different market segments. That situation can best be handled by allowing the LEC to offer services that are similarly targeted to particular groups of customers. Those services may then meet the criteria for streamlined regulation. Remaining customers would continue to enjoy the protection of unstreamlined regulation.

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[61]For example, Centrex has long faced stiff competition from PBXs. Special access services (particularly broadband) should also be afforded streamlined regulation in certain geographic areas.

[62]We do *not* address federal or state *legal* concerns that may be raised by deregulation.

[63]For example, some competitors, particularly providers of wireless services, may be able to serve small customers profitably.

It makes no sense for regulators to prevent LECs from offering services targeted to certain customers on the grounds of unreasonable discrimination. Where transactions and installation costs so indicate, the existing procompetitive regulatory policies already ensure that some customers will get lower rates than other customers. The key issue is whether the LEC will have an opportunity to compete effectively in all segments of the markets.

G. Discretionary Services

Arguments similar to the above can be made with regard to "discretionary" services. If the company raises the price of such a service, customers can exercise their discretion by refusing to buy it. This option limits the customers' loss. In addition, the prospect of lost sales makes it less likely that the company will raise rates in the first place.

For these reasons, the benefits of unstreamlined regulation of discretionary services are unlikely to justify the large reduction in efficiency incentives. We would therefore recommend streamlining the regulation of such services. Regulators would generally determine which services are discretionary, though there might be legislative guidelines. From an economics perspective, services should be classified as discretionary if their demands are sufficiently elastic to effectively discipline prices.

New telecommunications services that supplement existing offerings are generally discretionary and should be subject to streamlined regulation, for the reasons just discussed. This does not apply, however, to new services that displace basic services, which are then discontinued. Such new services are likely to be as essential as the services that they displace. Streamlined regulation of such a service would therefore be appropriate only if competitive suppliers provide comparable services and can reach customers who constitute a sizable fraction of demand.

Streamlining the regulation of new services (without earnings regulation) has the special advantage of encouraging successful innovations. It allows the firm to retain all the profits resulting from such innovations. Consumers also benefit through the availability of new alternatives. ROR regulation, on the other hand, limits the firm's upside potential, while imposing the risk of disallowances if the new service turns out to be unsuccessful.

Customers of discretionary and new services already have alternatives. Hence, the streamlining of regulation need not wait for any future expansion of competition. It should be done right away in order to bring customers the benefits of streamlined regulation.

IV. EFFICIENT PRICING

For decades, regulators have required telephone companies to price services in an economically-inefficient manner. Two important types of inefficient pricing are discussed in this section: (1) the overpricing of long-distance services (including long-distance access) in order to underprice local services; and (2) underdepreciation of plant.

Both types of inefficient pricing are politically popular but economically destructive. Such pricing may have made sense in an earlier era, when telephone penetration was low and competition was not present. Today, however, it simply constitutes bad public policy and will become increasingly counterproductive as competition intensifies over the next decade.

The challenge in this area is not to find a better way to price telecommunications services. That is easy. The challenge is to find a *politically feasible* way to phase out inefficient pricing practices. This goal must be accomplished before competition is ubiquitous in order to avoid serious dislocations; *e.g.*, very rapid price increases for consumers and/or financial distress for the incumbent or its competitors.

A. Overpricing of Long-Distance Services in Order to Underprice Local Services

Long-distance services are priced far above the levels that would obtain in a fully-competitive environment; *e.g.*, in a perfectly contestable market. Most local services, especially local usage (which is often free — *i.e.*, no usage-based charges), are priced below competitive levels.[64] The original rationale for such pricing was to promote universal service. However, universal service was, for all practical purposes, achieved long ago. Furthermore, the experience with Subscriber Line Charges (SLCs) in the 1980s demonstrates that telephone

[64]For further discussion, *see* John T. Wenders, *The Economics of Telecommunications* (Ballinger Publishing Company: Cambridge, Massachusetts), 1987.

penetration can continue to increase, even though local access rates increase.[65] We can reasonably conclude that the rationale for the current inefficient pricing is outmoded.

The excess of price above marginal cost of interstate services amounts to at least $7.0 billion per year. The excess of price above marginal cost is even greater at the state level — $11.3 billion per year.[66] Reducing interstate and intrastate long-distance rates would greatly stimulate demand for long-distance services and provide additional value to customers. On the other hand, the compensating increases in local rates would have little effect on telephone penetration. The loss of penetration could be further reduced through more efficient means such as targeted (*i.e.,* means-tested) subsidies and/or offering lifeline service (low fixed monthly charge, high charges for originating local usage).

While inefficient pricing is undesirable in any event, it becomes unfeasible when there is competition. Competitors, even if they are not efficient, can easily undercut rates that are padded by regulators to include noneconomic costs. For example, interstate switched access rates are constructed to recover substantial costs from all the following categories:

- loop costs
- costs of the main distributing frame
- capital costs on underdepreciated plant

None of these costs depend on the amount of switched access that the LEC provides. Competitors can provide access, while avoiding some or all of these costs.

The inevitable consequence of this inefficient pricing is that competitors take customers away from the LECs — not because the competitors are necessarily more efficient or better at meeting customer needs — but because regulators do not require them to recover

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[65]Part of the reason for this is that usage of long-distance services is widespread. The benefits of the SLCs in the 1980s, that is, lower long-distance prices, were received by a group nearly as broad as the group paying the SLCs. *See, e.g.,* Alexander Larson, Thomas Makarewicz and Calvin S. Monson, "The Effect of Subscriber Line Charges on Resident Telephone Bills," *Telecommunications Policy* (December 1989).

[66]*See* Jeffrey H. Rohlfs and Calvin S. Monson, *The $20 Billion Impact of Local Competition in Telecommunications,* prepared for the United States Telephone Association, July 16, 1993.

noneconomic costs in their prices.[67] As LECs lose business, they lose the contribution they formerly received from that business. LECs must then, in order to cover their costs (including a fair return on cost of capital), raise other rates, to customers who do not have alternatives. The end result is neither equitable nor efficient.

The harms from inefficient pricing can be mitigated to some extent by allowing LECs to have downward pricing flexibility in competitive markets. However, as competition intensifies LECs are unlikely to be able to cover their costs unless they can make partially compensatory rate increases in certain less-competitive markets.

If LECs are *not* permitted to raise prices in less competitive markets, they will not be able to cover their costs. Ultimately, they will be unable to attract capital, and their portion of the telecommunications infrastructure will deteriorate.

Imposing charges on competitors who do *not* interconnect with the local exchange may be viable (even desirable) in the short term. However, regulatory monitoring is inherently difficult, especially if there are many small competitors. Enforcement is therefore likely to be troublesome. Consequently, imposing charges on competitors who do not connect with the local exchange is unlikely to be a satisfactory long-term solution to the problem of inefficient pricing.

In 1984-1985, the FCC considered whether to impose such charges on "bypassers" and decided that such a plan was not workable. At that time, the Commission acknowledged that the existing pricing structure provided artificial incentives for bypass. but it regarded the problem as non-urgent at that time.[68]

The problem is urgent now. Well-funded competitors with ambitious growth plans already operate in a number of large cities. The Commission has recently ordered collocation and interconnection for switched and special access. As competition for transport services evolves, many customers will establish business relations with LEC competitors. That will facilitate the growth of end-to-end bypass, as well as competition for transport services.

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[67]Symmetric regulation of the incumbent and its competitors, on the other hand, allows only the most efficient firms to prosper and thereby improves industry performance. Streamlined regulation, where appropriate, also allows only the most efficient firms to prosper and *maximizes* industry performance.

[68]For further discussion of this issue, see D. Weisman and D. Lehman, "The Industry That Cried Wolf," *Public Utilities Fortnightly* (July 1, 1993).

The Commission should immediately begin to phase out regulatory policies whose social welfare benefits no longer outweigh the growing costs of inefficient pricing. Such action will become progressively more difficult over time, as competitors grow. Competitors will make sizable investments and hire employees, based on the current rate structure. The dislocations resulting from restructuring will become more serious and more difficult to remedy, the longer that restructuring is delayed.

Eliminating inefficient pricing entails rate reductions in long-distance services (including long-distance access) and rate increases for local services. On the interstate level, increasing subscriber line charges (SLCs) is one way to accomplish these goals. Unfortunately, increasing the SLC for residents and single-line business turned out to be politically volatile when it was attempted in the mid-1980s. Yet, in the long term, the best way for regulators to ameliorate the problems of inefficient pricing is to give LECs some discretion to price in response to market conditions, rather than subject to inflexible regulatory rules. This might involve raising local rates where appropriate and in accordance with regulatory guidelines, while lowering long-distance access charges.[69] Political sensitivities can be assuaged to some extent, but not entirely, by restructuring prices gradually over time. Gradual restructuring will be possible only if it begins very soon.

In the meantime, the Commission should take measures to ensure that inefficient pricing does not lead to inefficient competition; *i.e.*, that inefficient pricing does not attract competitors who can survive only because of regulators' set prices of competitive services far above cost in order to underprice other services. Such policies should be competitively neutral and minimize inefficiencies.

Part of the solution is to have a general policy that includes an appropriate and clearly-defined contribution element in the charge for interconnection. However, end-to-end bypass from the customer to the interexchange carrier does not involve interconnection. Consequently, an interconnection charge would not apply to end-to-end bypass. An interconnection contribution element could, therefore, solve only a small part of the problem. Additional measures are necessary to avoid encouraging uneconomic end-to-end bypass.

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[69]In this paper, we do not address the legislative alternative of raising taxes to support low rates for local telephone services.